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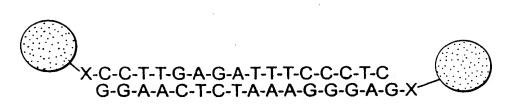
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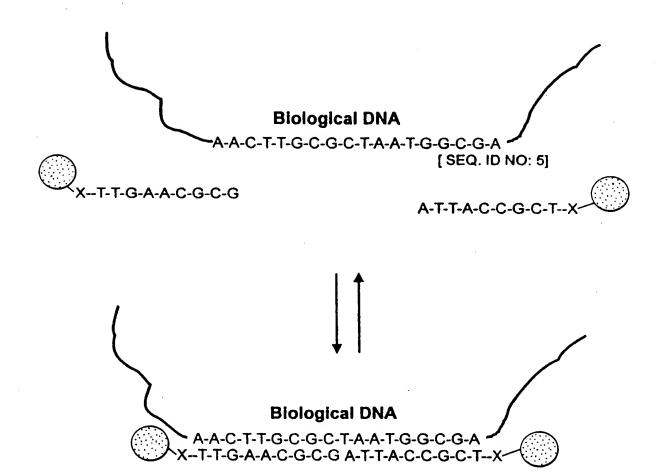


[ SEQ. ID NO: 3] X-C-C-T-T-G-A-G-A-T-T-T-C-C-C-T-C 5'

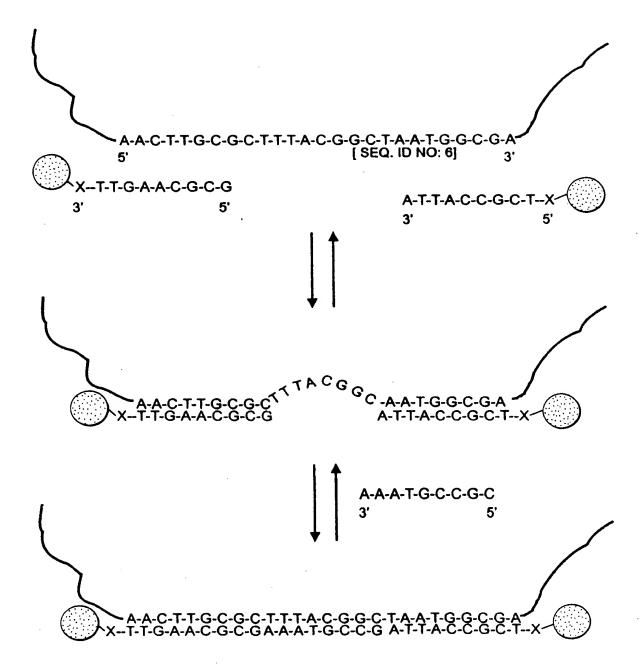
G-G-A-A-C-T-C-T-A-A-A-G-G-G-A-G-X
[ SEQ. ID NO: 4]











Aggregate



Linking oligonucleotide 

X-T-A-C-C-G-T-T-G

A-G-T-C-G-T-T-T-X

Colloids

Heat Mix below Tm

Precipitate (formed by further cross-linking)



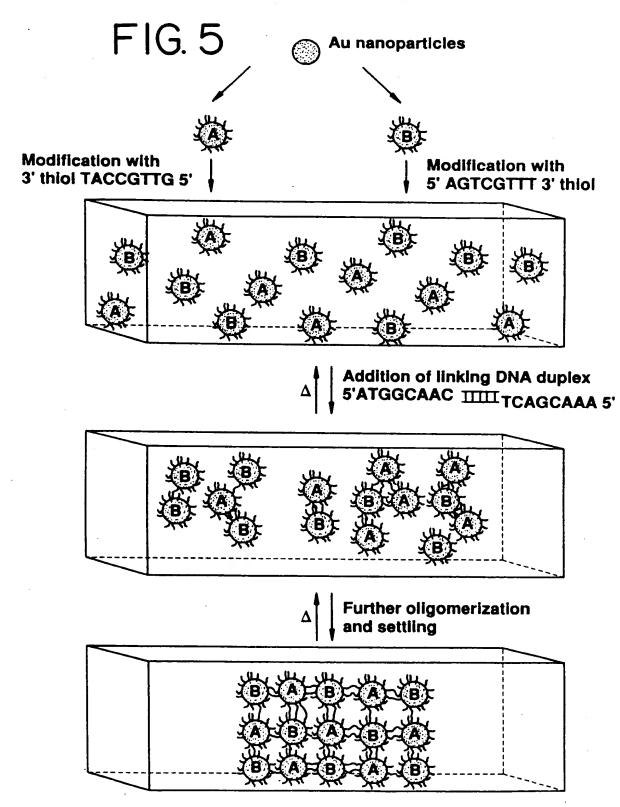
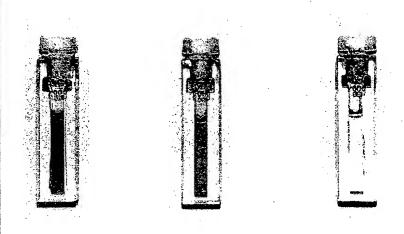
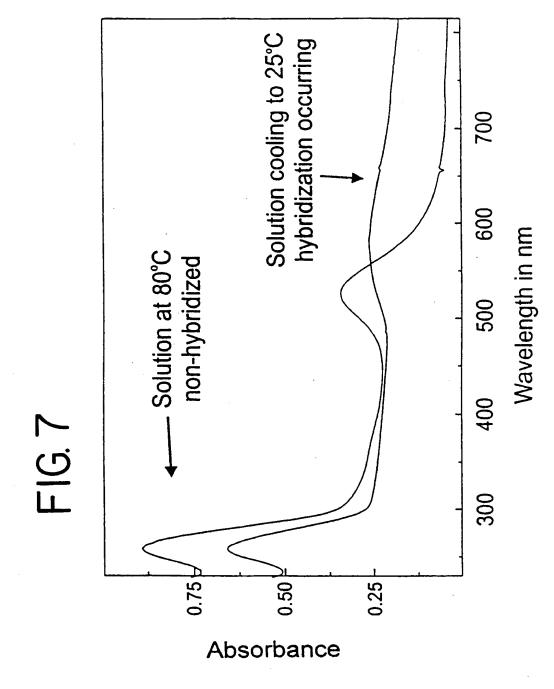




FIG. 6A FIG. 6B FIG. 6C









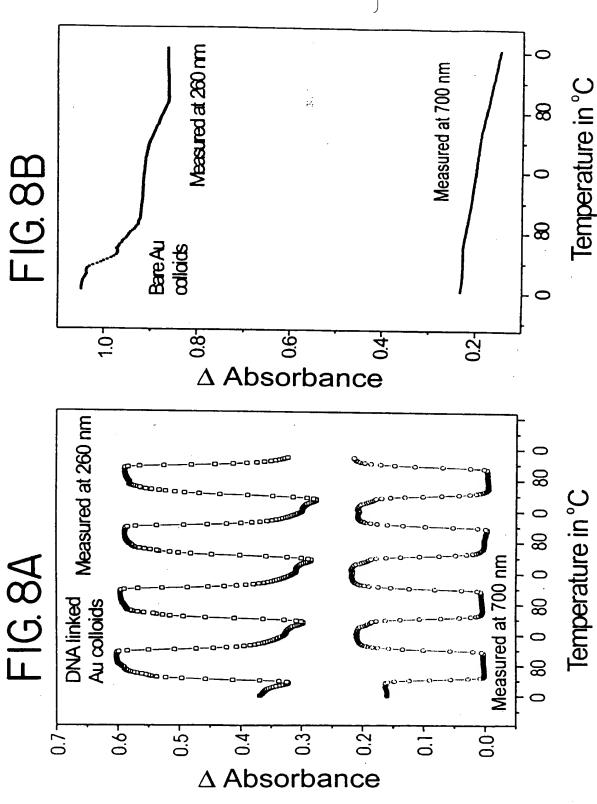




FIG. 9A

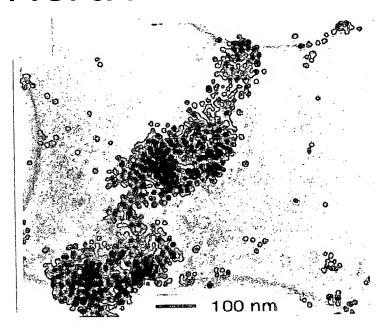
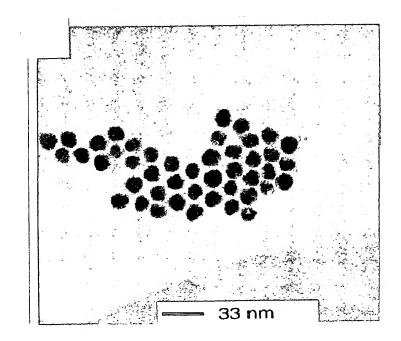


FIG. 9B



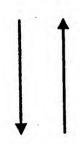


[SEQ ID NO: 7]

5'
X--T-C-T-C-C-T-T-C-C-C-T-T-T-C
A-G-A-G-G-A-A-G-X
3'

[SEQ ID NO: 8]

3' T-C-T-C-C-T-T-C-C-C-T-T-T-T-C 5' [SEQ ID NO: 9]



5' 3' X--T-C-T-C-C-T-T-C-C-C-T-T-T-C A-G-A-G-G-A-A-G-X T-C-T-C-C-T-T-C-C-C-T-T-T-C 5'



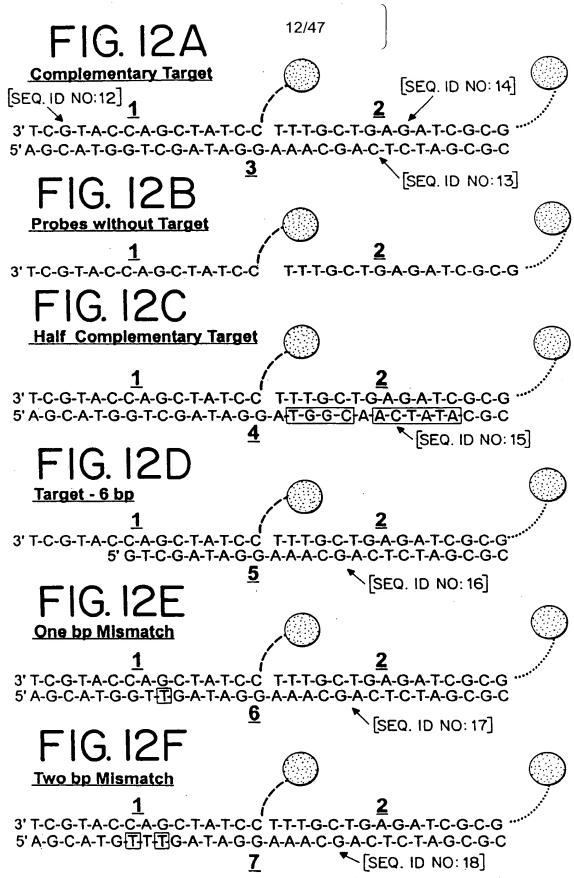
### FIG. II

[SEQ. ID NO: 10] S-A-T-G-G-C-A-A-C-T-A-C-G-C-T-A-G-A-G-T-C-G-T-T-T 5'

T-A-C-C-G-T-T-G-A-T-A-T-G-C-G-C-G-A-T-C-T-C-A-G-C-A-A-S-13'
3'
[SEQ. ID NO: 11]

\_S\_







#### FIG. 13A

transparent substrate

Modified DNA chemisorbed onto solid substrate

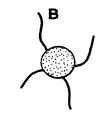
∫A'

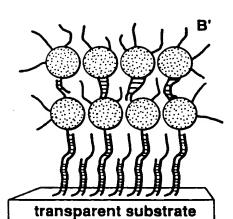
**Analyte DNA** 

transparent substrate

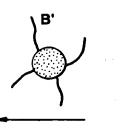
Analyte DNA hybridized onto substrate

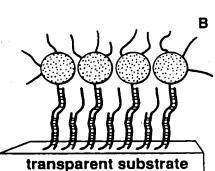
DNA modified colloids





Dark areas where nanoparticle aggregates are linked to substrate surface by analyte DNA





DNA modified colloids hybridized to bound analyte DNA

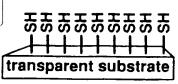


FIG. 13B

14/47

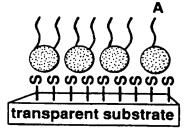
transparent substrate

thiol terminated modification of surface

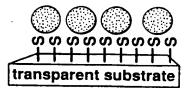


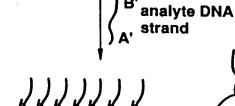
gold nanoparticles





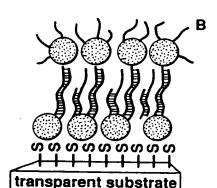
thiol modified DNA adsorbed onto particles





transparent substrate

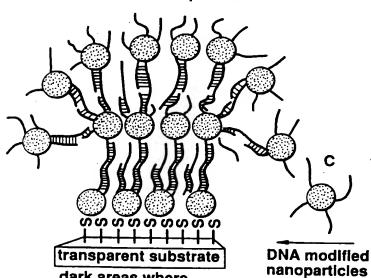
DNA modified nanoparticles



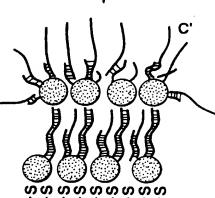
analyte DNA hybridized to DNA modified nanoparticles

nanoparticle linker strand



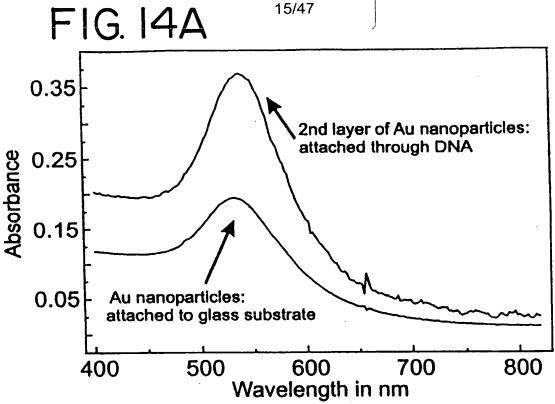


dark areas where
nanoparticle aggregates linked
to substrate by analyte DNA



transparent substrate





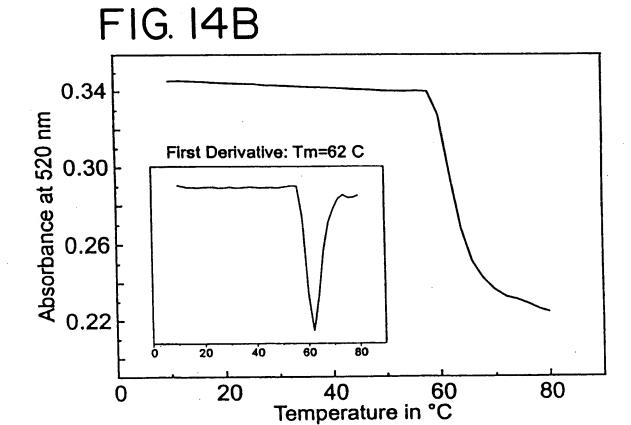




FIG. 15A Probes with No Target 16/47 SEQ ID NO:19 SEQ ID NO:20 Haif-Complementary Target FIG. 15B - SEQ ID NO:21 5' TAC-GAG-TTG-AGA-GAG-TGC-CCA-CAT 3' S-ATG-CTC-AAC-TCT TAG-GAC-TTA-CGC-S **FIG. 15** Tm=53.5°C Complementary Target - **SEQ ID NO:22** 5' TAC-GAG-TTG-AGA-ATC-CTG-AAT-GCG 3' S-ATG-CTC-AAC-TCT TAG-GAC-TTA-CGC-S Tm=50.4°C ONE Base-Pair Mismatch at Probe Head - **SEQ ID NO:23** 5' TAC-GAG-TTG-AGA-ATC-CTG-AAT-GC<u>T</u> 3' S-ATG-CTC-AAC-TCT TAG-GAC-TTA-CGC-S Tm=46.2°C ONE Base-Pair Mismatch at Probe Tall **SEQ ID NO:24** 5' TAC-GAG-TTG-AGA-CTC-CTG-AAT-GCG 3' S-ATG-CTC-AAC-TCT TAG-GAC-TTA-CGC-S Tm=51.6°C **ONE Base Deletion** FIG. 15F - **SEQ ID NO:25** 5' TAC-GAG-TTG-AGA-ATC-CTG-AAT-GC□ 3' S-ATG-CTC-AAC-TCT TAG-GAC-TTA-CGC-S FIG. 15G

**ONE Base-Pair Insertion** 

Tm=50.2°C

- SEQ ID NO:26 5' TAC-GAG-TTG-AGA-CAT-CCT-GAA-TGC-G 3'

S-ATG-CTC-AAC-TCT TA-GGA-CTT-ACG-C-S



## FIG. 16A

## 24 Base Template

~ S-ATG-CTC-AAC-TCT TAG-GAC-TTA-CGC-S 5' TAC-GAG-TTG-AGA-ATC-CTG-AAT-GCG 3'

## FIG. 16B

# 48 Base Template with Complementary 24 Base Filler

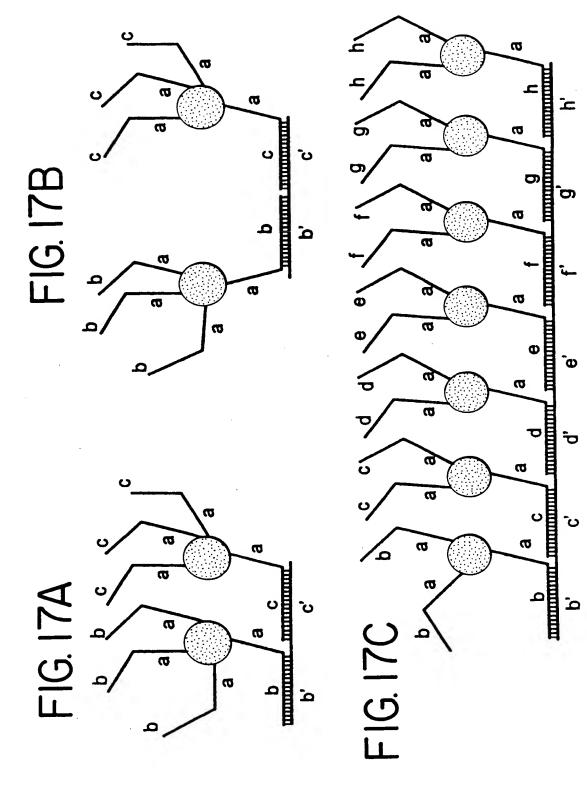
5' TAC-GAG-TTG-AGA-CCG-TTA-AGA-CGA-GGC-AAT-CAT-GCA-ATC-CTG-AAT-GCG 3' -> S-ATG-CTC-AAC-TCT GGC-AAT-TCT-GCT-CCG-TTA-GTA-CGT TAG-GAC-TTA-CGC-S

## F1G. 16C

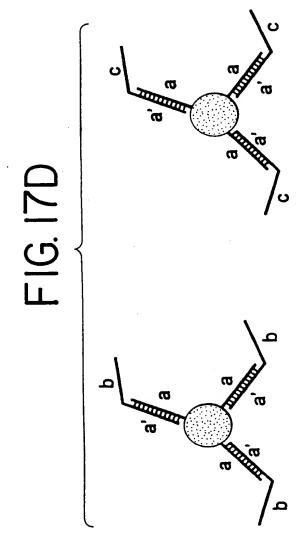
# 72 Base Template with Complementary 48 Base Filler

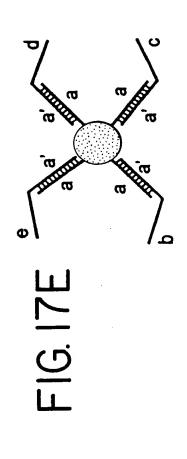
✓ S-ATG-CTC-AAC-TCT GGC-AAT-TCT-GCT-CCG-TTA-GTA-CGT-ATA-TAA-CCT-GCG-AAA-TGC-CTG-TTG TAG-GAC-TTA-CGC-S ~ 5' TAC-GAG-TTG-AGA-CCG-TTA-AGA-CGA-GGC-AAT-CAT-GCA-TAT-ATT-GGA-CGC-TTT-ACG-GAC-AAC-ATC-CTG-AAT-GCG 3'



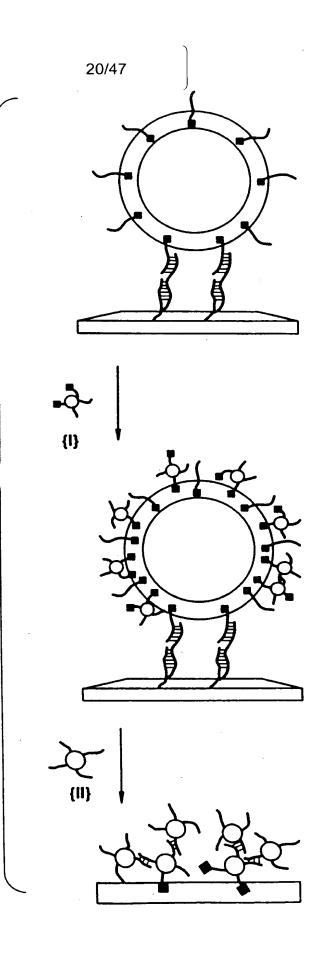




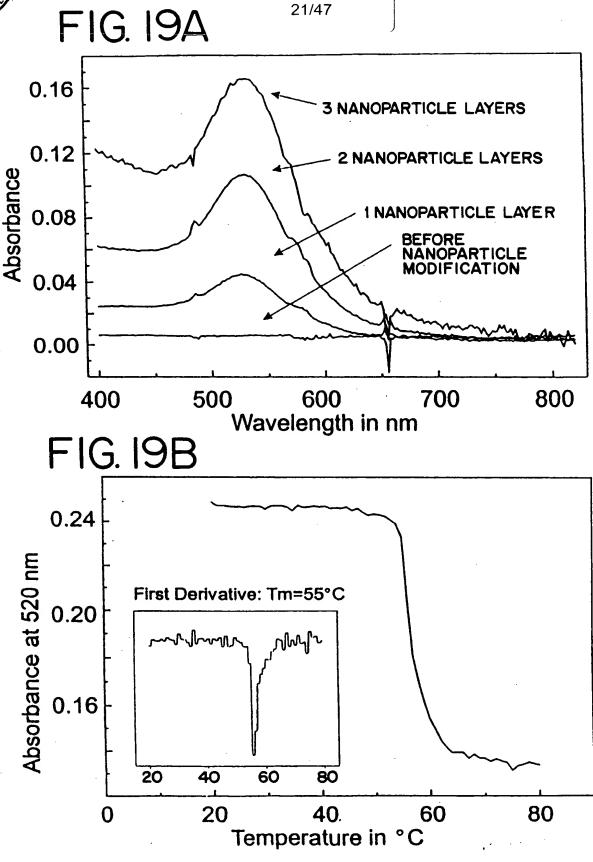






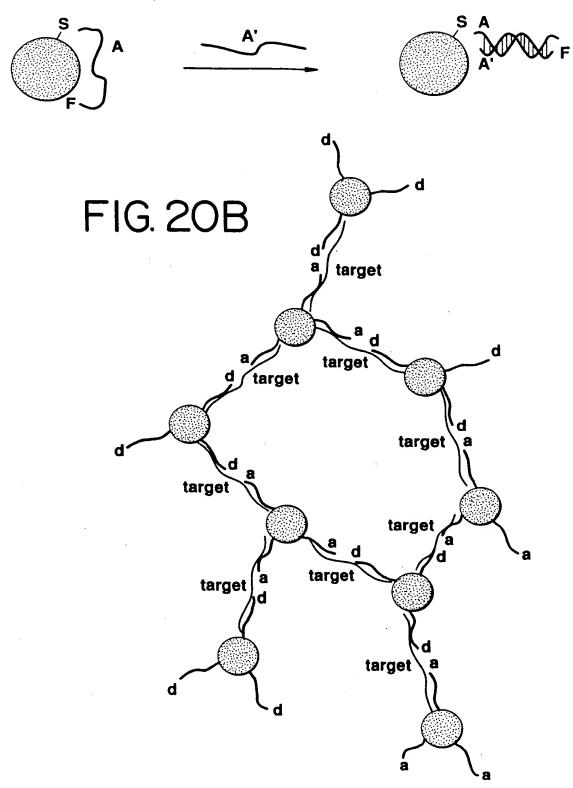








#### FIG. 20A





Pink/Non-fluorescent Au/Latex hybrid Target Oligonucleotide Target Oligonucleotide oligonucleotide modified Fluorophore labeled No Target Oligonucleotide White/Fluorescent latex probes nanoparticle probes Oligonucleotide modified Au Red FIG. 21

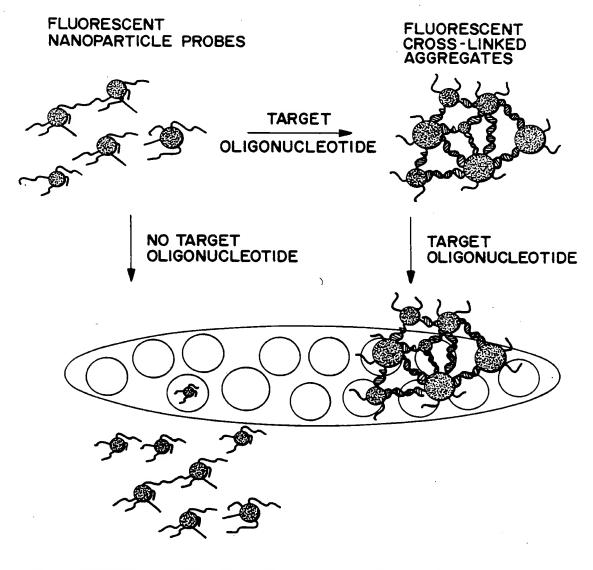
**Excess Au probes** pass through membrane

0000

All Au probes pass

through membrane





THE FLUORESCENT NANOPARTICLE PROBES PASS THROUGH THE MEMBRANE

THE FLUORESCENT CROSS-LINKED AGGREGATES ARE RETAINED BY THE MEMBRANE



#### Anthrax PCR Product

5'G GCG GAT GAG TCA GTA GTT AAG GAG GCT CAT AGA GAA GTA ATT AAT 3'C CGC CTA CTC AGT CAT CAA TTC CTC CGA GTA TCT CTT CAT TAA TTA

TCG TCA ACA GAG GGA TTA TTG TTA AAT ATT GAT AAG GAT ATA AGA AAA AGC AGT TGT CTC CCT AAT AAC AAT TTA TAA CTA TTC CTA TAT TCT TTT

ATA TTA TCC AGG GTT ATA TTG TAG AAA TTG AAG ATA CTG AAG GGC TT 3' TAT AAT AGG TCC CAA TAT AAC ATC TTT AAC TTC TAT GAC TTC CCG AA 5'

141 mer Anthrax PCR product [SEQ ID NO:36]

3' CTC CCT AAT AAC AAT

[SEQ ID NO:37]

3' TTA TAA CTA TTC CTA

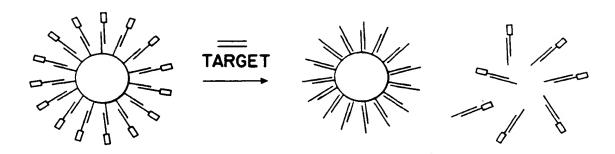
[SEQ ID NO:38]

Oligonucleotide-Nanoparticle Probes

#### **Blocker Oligonucleotides**

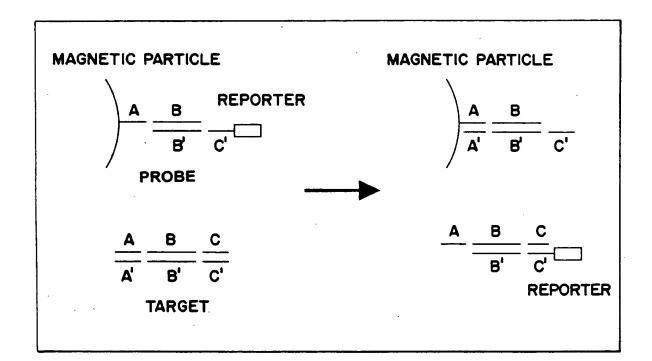
3' C CGC CTA CTC AGT CAT CAA TTC CTC CGA GT	[SEQ ID NO:39]
3' A TCT CTT CAT TAA TTA AGC AGT TGT	[SEQ ID NO:40]
3' TAT TCT TTT TAT AAT AGG TCC CAA TAT	[SEQ ID NO:41]
3' AAC ATC TTT AAC TTC TAT GAC TTC CCG AA	[SEQ ID NO:42]





SATELLITE PROBE

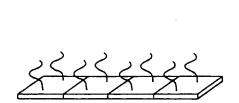
**DETECTION SIGNAL** 

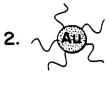






### FIG. 25A





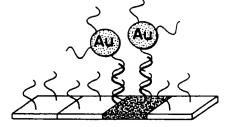
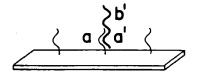
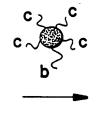


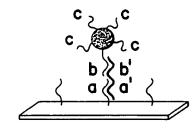
FIG. 25B

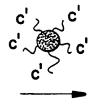


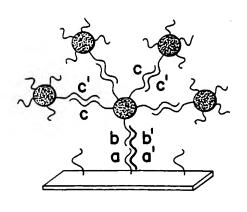


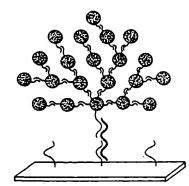






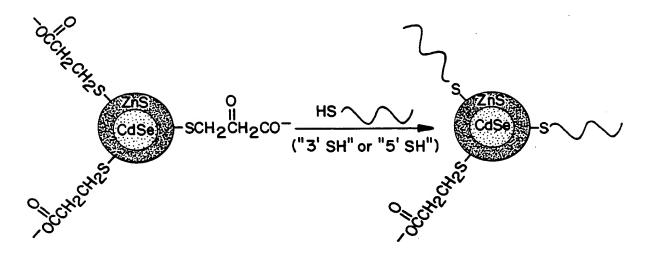




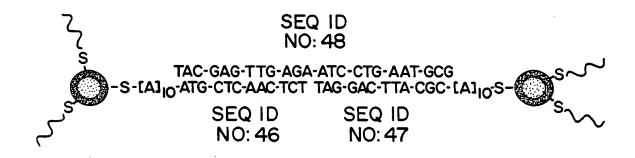




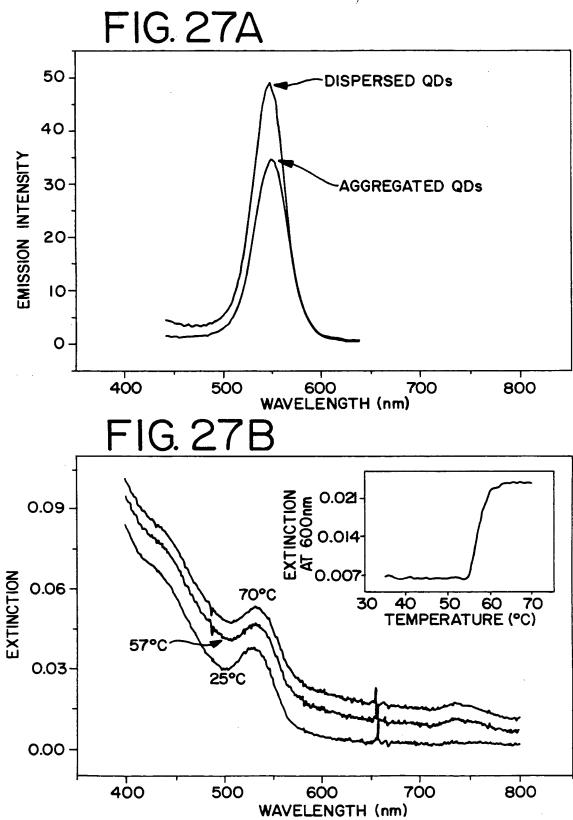
#### FIG. 26A



#### FIG. 26B









#### FIG. 27C

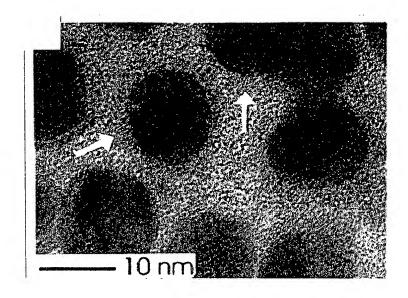
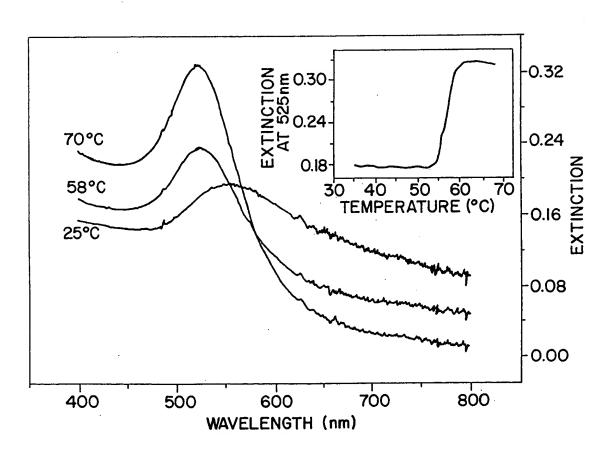


FIG. 27D



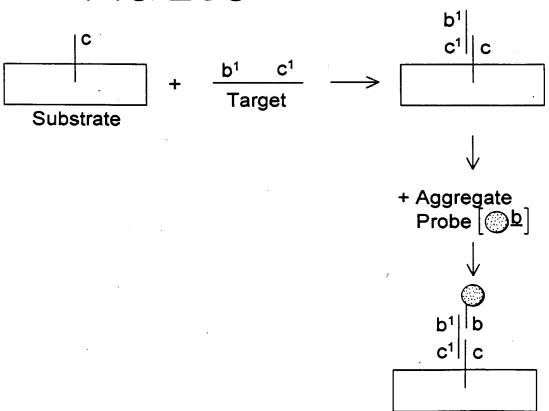


#### FIG. 28A



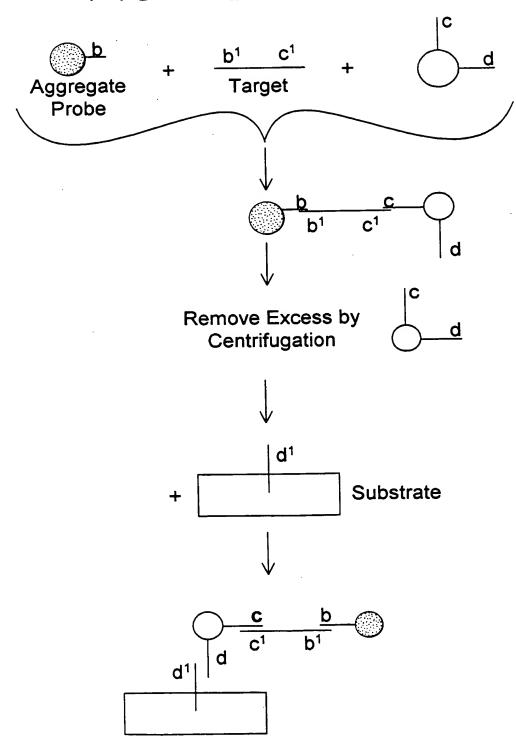
#### FIG. 28B

#### FIG. 28C



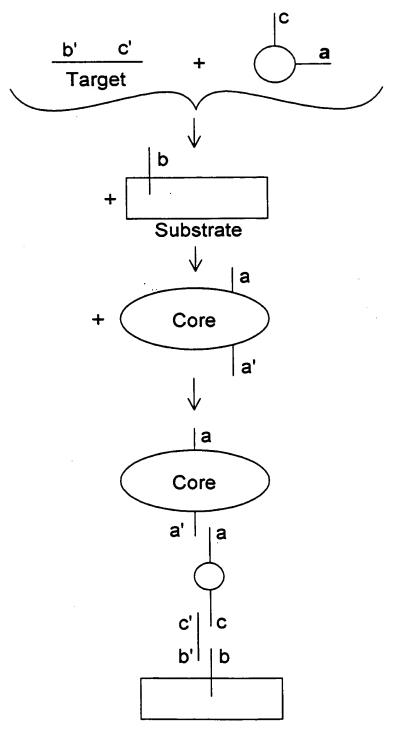


#### FIG. 28D

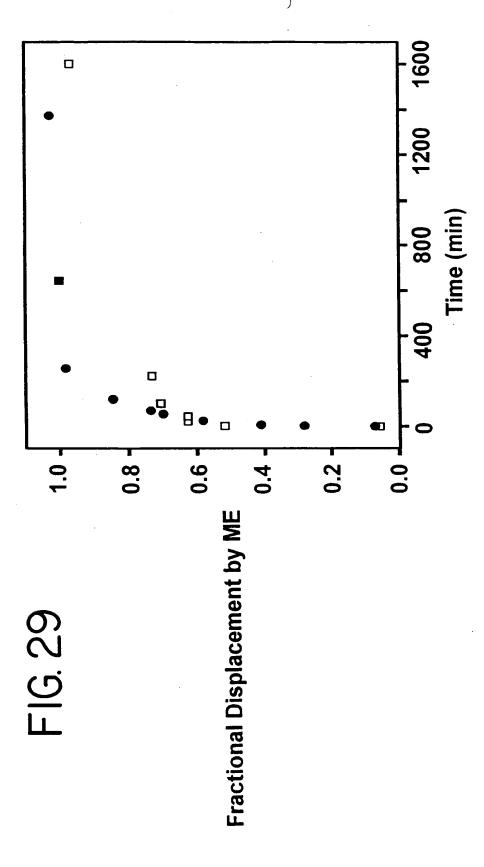




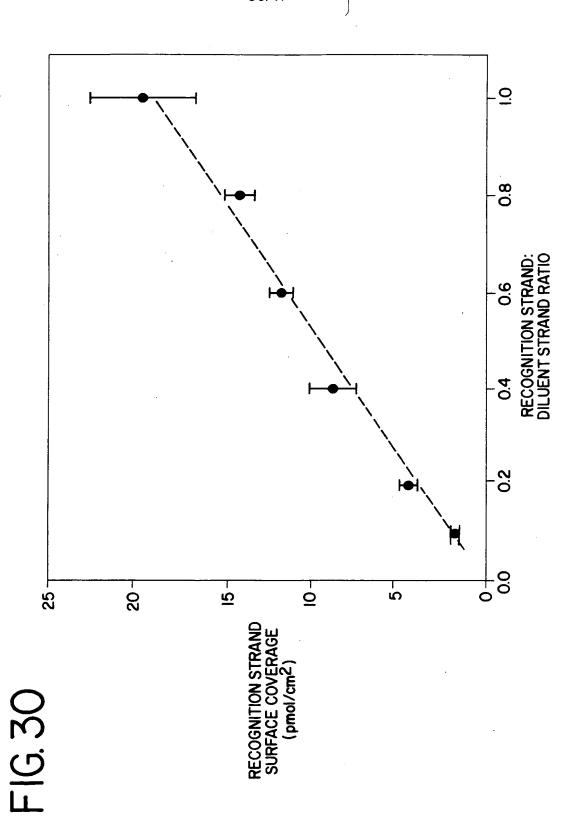
#### FIG. 28E



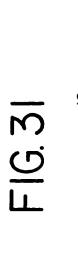


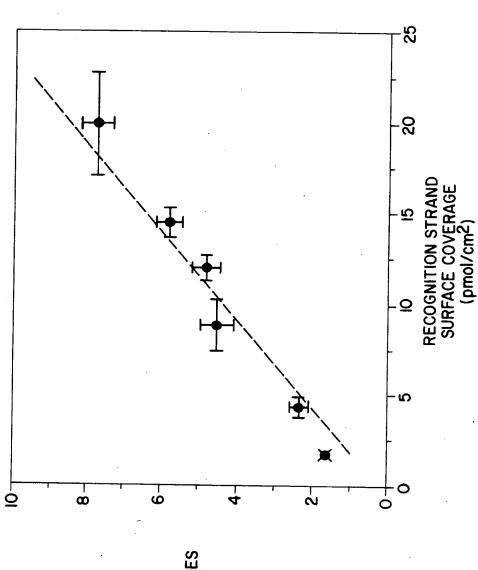














## FIG. 32

[SEQIDNO:56]

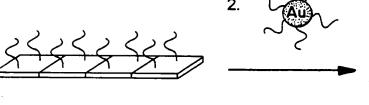
5' GGA TTA TTG TTA- -AAT ATT GAT AAG GAT 3' CCT ANT AAC AAT TTA TAA CTA TTC CTA

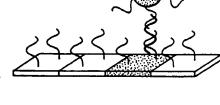
[SEQ ID NO: 57]

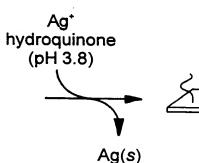
[SEQ ID NO: 58]

**N** = A (complementary), G,C,T (mismatched)

2.







quinone

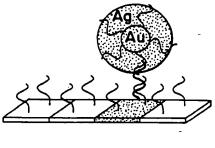
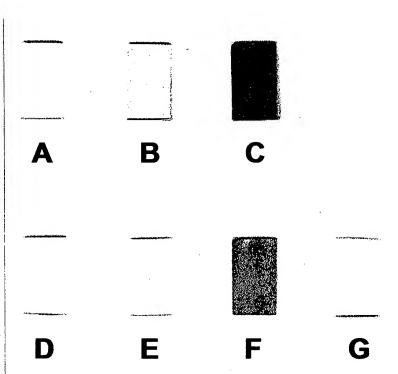
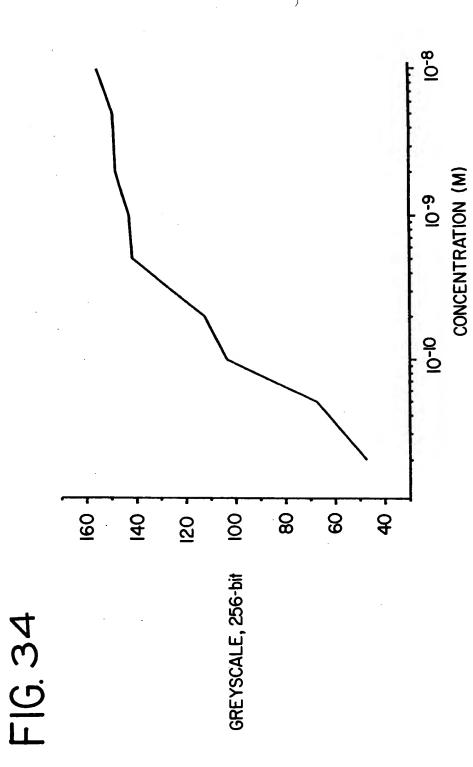




FIG. 33

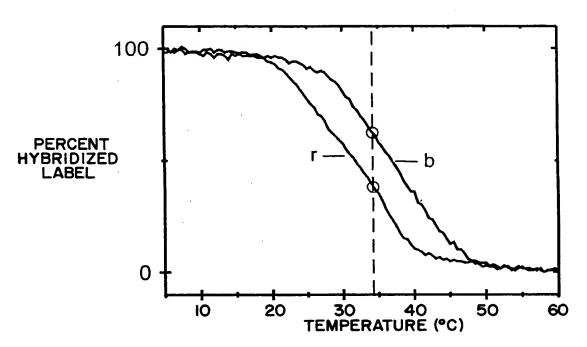












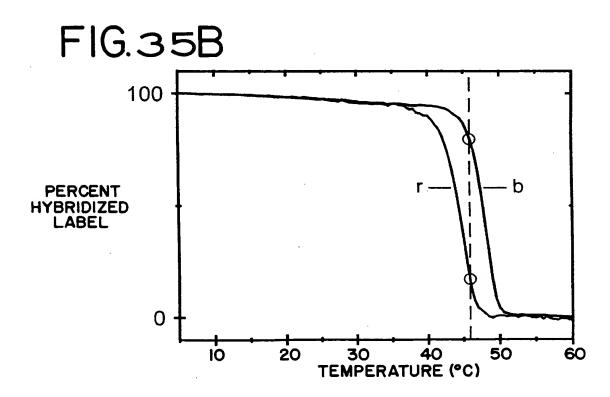




FIG. 36A

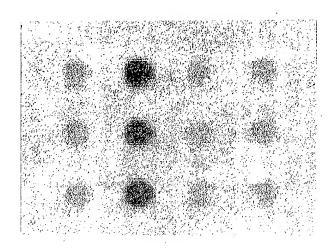


FIG. 36B

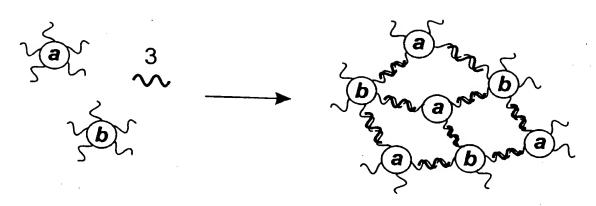


CATG

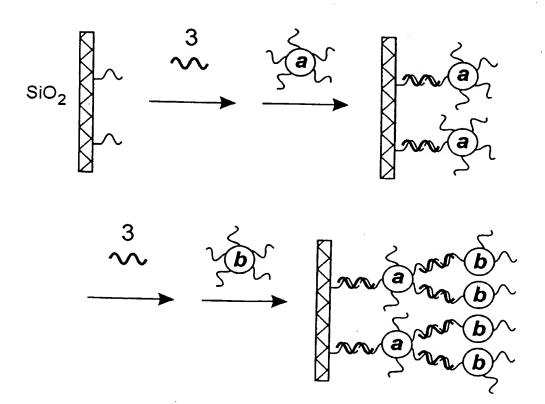




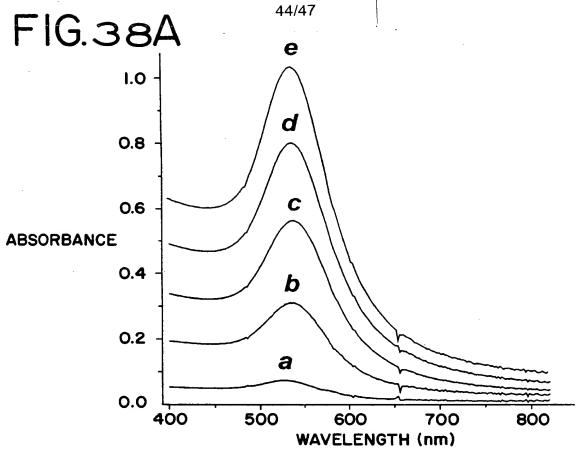
## FIG.37A



## FIG.37B







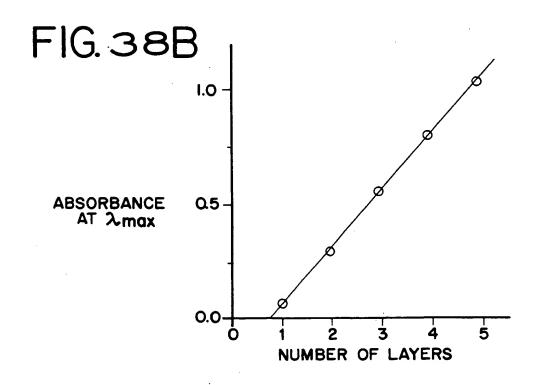




FIG. 39A

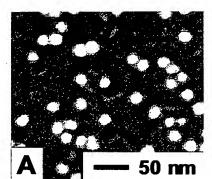


FIG. 39B

